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Public-private partnerships and their role in enhancing the cargo handling efficiency of container lines in the Black Sea

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ABSTRACT
The article discusses the current situation in the container shipping market and the terminal infrastructure in the Black Sea region. The analysis is based on the container fleet database accumulated by the author. These data are used for making observations and predictions and drawing conclusions about the dynamics of the marine transportation market. The methodological framework comprises theoretical, empirical and mathematical methods. The comparative analysis of container services of different Russian terminals and ports has shown that the market is now undergoing major transformations and suffers from a considerable imbalance due to the rapid growth in deadweight tonnage and the insufficient capacity of the infrastructure, which means that it is unable to keep up with the rising demand. The excess of deadweight tonnage and the shortage of the necessary equipment leads to chronic bottlenecks in cargo handling, cargo clearance and so on. To address these problems, it is proposed to explore the opportunities provided by the integration of public-private partnerships into the service structure of maritime transport. By focusing on the case of the Russian port of Novorossyisk, the article demonstrates that public-private partnerships are able to enhance the efficiency of cargo-handling operations of container lines in the Black Sea region.

KEYWORDS
public-private partnership, logistics, maritime transport, world fleet, container ships, container lines, Black Sea

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Государственно-частное партнерство – как инструмент повышения интенсивности терминальной обработки контейнерных линий черноморского региона

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АННОТАЦИЯ
В данной статье рассмотрено состояние рынка контейнерных перевозок и инфраструктуры терминального сервиса на сегодняшний день. Проведенное исследование и собранная информация позволили проанализировать нынешнее состояние рассматриваемого сегмента рынка. База данных контейнерного флота, накопленная автором статьи для дальнейшего определения уровня рынка и расчетов показателей флота и последующее наблюдение, предоставляет возможности для дальнейшего развития исследования. В рамках статьи автором были применены теоретические, эмпирические и математические методы. Основной целью данной статьи является проведение аналитического исследования рынка контейнерных услуг и управления флотом; сбор актуальных данных; проведение компаративного анализа сервиса контейнерного флота различных терминалов и определение уровня сервиса на терминалах российских морских портов. Состояние рынка контейнерных перевозок претерпевает масштабные изменения и приводит к дисбалансу отрасли в связи со стремительным ростом тоннажа и неподготовленности сервиса к созданному грузообороту. В современных экономических условиях при избытке тоннажа и дефиците оборудования, соответствующими последствиями ожидается возникновение узких мест на этапах терминальной обработки и оформлении груза в контейнерных перевозках и т.д. В поисках решения проблем в этой связи автором предлагается рассмотреть возможность привлечения Государственно-частного партнерства в сервисную структуру морского транспорта, как инструмент повышения интенсивности терминальной обработки контейнерных линий рассматриваемого черноморского региона с последующими выводами.

КЛЮЧЕВЫЕ СЛОВА
государственно-частное партнёрство, логистика, морской транспорт, мировой флот, контейнерные суда, контейнерные линии, черноморский регион

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Introduction

The Russian national economy is now becoming more and more open and integrated into the global economic system, which means that it has come to rely more heavily on transport infrastructure. Therefore, it is crucial to analyze the work of maritime transport infrastructure, in particular container terminals and ports. As the international division of labour grows deeper and the international trade relations expand, the container segment in the international logistics supply chain also grows in importance. Interactions between international container lines and container terminals are determined by the current trends in the development of trade fleet and regional transport hubs. It is necessary to consider further stages and prospects of development of the Russian port infrastructure and the related strategic decisions. In this respect, it would be interesting to assess the potential of public-private partnerships in the sphere of maritime transport development.

Maritime transport plays a special role in the development of the global trade infrastructure. The structure of maritime transport is determined by a set of factors, including the demands of the market. In their turn, trade organizations face financial risks when trying to create a certain transport and logistics relationships on the basis of the already existing infrastructure. Their attempts to minimize these risks lead to an increase in the demand for container shipping services.

In addition to the risks, container transportation also allows us to minimize transportation costs and time intervals for cargo handling at terminals. Cargo stored in containers does not require additional storage facilities, since the site is used as a warehouse. Introduction of public-private partnerships (PPP) in this segment of maritime transport will let us attract more suppliers to the Russian market, expand the range of export and import and accelerate the processing of ships at a terminal. PPP has different forms of organization and can be used in a range of investment deals and infrastructure industry complexes[1]. The main forms of PPP are as follows:

– BOT (Build, Operate, Transfer) is a form of project financing, wherein a private entity receives a concession from the private or public sector to finance, design, construct, own, and operate a facility stated in the concession contract;

– BOO (Build, Own, Operate) means that a private entity builds, owns and operates some facility or structure receiving some financial incentives from the government;

– BOOT (Build, Own, Operate, Transfer) means that a private organization conducts a large development project under contract to a public-sector partner, such as a government agency;

– DBFM (Design, Build, Finance, Maintain) means that the private sector is responsible for the design, building, finance and maintenance of an asset, which incentivises the private sector to design the asset taking into account the long-term maintenance required.

In this article we are going to look at the current state of the sea container fleet and container terminals in the Black Sea region, in order to identify the bottlenecks and opportunities to eliminate them with the help of PPP.

The Black Sea plays an important role in Russian economy with Novorossiysk ranking first in terms of cargo turnover in Russia and third in Europe[2]. We believe that the PPP holds most potential for the development of the regional transport industry. Taking into account this consideration, we are going to research the condition of the world container market and compare it with the situation in the Black Sea region, in particular the ways of enhancing the cargo handling efficiency of container lines.

Theoretical framework

PPP means cooperation between public and private entities primarily for infrastructure provision within a certain area or region. PPP and its role in regional economies was discussed by G. P. Hasaev, S. A. Martishkin [1], D. I. Shabunin and others. Container shipping management was studied by Malcolm McLean, E. L. Limonov [2], V. V. Vinnikov [3], O. N. Baburina [4; 5], V. K. Tsygankov [6] and others. Other authors researching the problems of container shipping include L. Edirisinghe, Zhihong Jin, A. W. Wijeratne [7], I. Rekik, S. Elkosantini [8].

Lalith Edirisinghe, Zhihong Jin, and A. W. Wijeratne focus on the practical aspects of container exchange and its potential for addressing the problem of imbalance in world trade. Ines Rekik and Sabeur Elkosantini also analyze the container market and seaport terminals service levels as well as the storage area. Eugene Korovyakovsky

[1] *Guidelines for Project Realization of Public-Private Partnership in Russian Regions* (2013). The PPP Development Center, Moscow

[2] *Retrieved from Source or supplier information*. Retrieved from: https://www.vestifinance.ru/articles/108278?page=1

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and Yulia Panova [9] provide an overview of the dynamics of Russian dry ports.

In this article, we are going to analyze the available data on the market of container services, compare the services provided by different terminals, assess the current level of terminal services in Russian Black Sea ports, and discuss the ways of optimizing them.

Methodology

The methodological framework of this research includes empirical, theoretical and mathematical methods: data collection, structuring, comparative analysis and mathematical calculations. Our analysis relies on the data on the world merchant marine fleet and follows the procedure described below. First, to get a clear picture of the current situation in the container market, we need to collect the data such as the vessel types, sizes, tonnage and capacity, age range and container liner operators. These data can be obtained from the 'Review of Maritime Transport' of 2016 and 2017 [10; 11] and the data on the Russian sea ports found in dispatchers' daily reports. Second, we are going to structure and visualize the results of our calculations. Third, it is necessary to systemize the results of research for further comparative analysis of the world port practices and the practices of Black Sea ports and terminals. Finally, we are going to formulate recommendations concerning the ways to enhance the efficiency of cargo handling in the terminals of the Black Sea region.

Discussion

The structure of the world trade fleet reflects the demand for container shipping, as the total deadweight of the fleet and its share in the total tonnage increases. In 2017, the fleet of dry cargo vessels accounted for 43.2% of the world fleet by deadweight and 17.2% by value. The analysis of the structure of the maritime transport market has shown the market share of standard vessels by deadweight and the share of the total fleet [10, p. 25]. As part of the analysis of the structure of the world fleet in terms of deadweight, the dry cargo fleet occupies the leading position of the world fleet. The tanker fleet is in the second place, and container ships are in the third place. Vessels for the transportation of general cargo rank fourth (Table 1).

The growth of the fleet is reflected in the comparative figures of the total tonnage for the period from 2015 to 2017, in which it increased by 6.69%. With the decline in the share of the typical vessels of the total fleet, the total tonnage over the period from 2015 to 2016 increased by 3.47%, and in the period from 2016 to 2017, it grew by 3.06%. Therefore, when considering the structure of the model fleet, it becomes apparent that the share of tankers and container ships among the total deadweight increased in comparison with 2015 and 2017. In 2017, the average age of the commercial fleet exceeded the ones in 2016 by 0.7 age units and was 20.6 years in total (Table 2) [10, p. 27]. The age segmentation of the world fleet varies from the indicators of newly built ships to the number of decommissioned or obsolete ships. In comparison with the established opinion about the average age of the world fleet, the indicators of 2017 indicate a fairly 'young' age of ships, especially those in the segment of dry cargo and container ships. The fleet of countries with developing economies is on average 10 years older than ships of countries with developed economies (see Table 2). Therefore, it makes sense to indicate that vessels of various types, such as tankers, general vessels and others, are considerably older in terms of the average age of a fleet than the youngest fleet of dry cargo and container ships [12, p. 91]. It also becomes evident that over the past 15–19 years, ship sizes have undergone some significant changes. Prior to that, the largest types by deadweight were dry cargo ships and tankers, but over the past few years, the container fleet has

Table 1

Structure of the world trade fleet, 2015–2017

Vessel type	Deadweight, thous. tons			Share, %	
	2015	2016	2017	2015	2016
Bulkers	761,776	778,890	796,581	43.6	43.1
Oil tankers	488,308	503,343	534,887	28	27.9
Container ships	228,224	244,274	245,609	13.1	13.5
General cargo vessels	74,158	75,258	74,823	4.2	4.2
Others	193,457	204,886	209,984	11.1	11.5
Subtotal	1,745,923	1,806,651	1,861,884	100	100

Source: UNCNAD secretariat calculations, based on the data from Clarksons Research.

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caught up with the leaders in this indicator. The previously mentioned dimensions and capacity of container ships are currently being brought to the maximum level, and further growth is not being planned in terms of potential opportunities and the bandwidth of channels and straits. In the past five years, the market of sea container transportation of linear type has been characterized by rigorous competition [13], which required enormous expenses on the part of the carriers. They had to invest in the new fleet consisting of larger ships (container ships), which lead to a decrease in freight rates for the container on average in affordable areas; a decrease in the frequency of servicing; increase in port charges for ship handling; and shortages of container equipment.

The specificity of chartering a container fleet lies in the cellular-like structure of the onboard/bilge space used to store containers [14]. A fully-cellular container vessel is a cellular type of a container carrying ship. This type of container ship makes up 98% of the world container fleet. If, in the market of bulk cargo, loading depends primarily on the calculation of the cargo capacity of the vessel according to its specific weight, capacity and carrying capacity, then in linear container transportation the calculation is made for each container, according to its capacity and carrying capacity [15].

This kind of loading can be compared with chartering 'part cargo'. In this case, the hold and freight are divided between charterers, and, as a rule, this type of chartering is common, both in the general cargo market and in the beam market.

The organization and management of the container fleet within the line depend on inter-

Table 2

Age and quantitative distribution of the world fleet by vessel types and economic affiliation for 2016–2017

Economic grouping and vessel type 0–4		Years					Average age		% change
		5–9	10–14	15–19	20+	2017	2016	2016–2017	
World fleet									
Bulk carriers	% of total ships	35.77	33.8	12.05	9.33	9.05	8.8	8.8	0.00
	% of deadweight tonnage	38.66	34.88	11.91	7.55	7.01	7.95	7.94	0.01
	Average vessel size (dwt)	79,099	75,525	72,283	59,244	56,673			
Container ships	% of total ships	18.63	30.5	22.72	15.66	12.5	11.55	11.1	0.45
	% of deadweight tonnage	31.51	32.57	20.82	10.17	4.92	8.72	8.39	0.33
	Average vessel size (dwt)	80,624	50,891	43,679	30,961	18,751			
General cargo ships	% of total ships	7.68	16.5	10.20	7.54	58.08	25.21	24.44	0.76
	% of deadweight tonnage	14.98	24.7	12.23	10.24	37.85	18.29	17.83	0.46
	Average vessel size (dwt)	8,118	6,081	5,086	5,630	2,561			
Oil tankers	% of total ships	16.03	22.51	15.46	7.74	38.26	18.76	18.36	0.4
	% of deadweight tonnage	22.07	34.74	24.44	12.67	6.09	9.9	9.54	0.36
	Average vessel size (dwt)	73,274	82,242	84,610	89,498	8,777			
Other	% of total ships	14.37	18.65	10.60	8.43	47.96	22.73	22.25	0.48
	% of deadweight tonnage	19.4	26.43	14.21	10.29	29.67	15.58	15.65	0.07
	Average vessel size (dwt)	7,777	7,907	8,004	7,144	3,954			
All ships	% of total ships	11.75	17.97	10.13	7.00	53.15	20.57	19.92	0.65
	% of deadweight tonnage	29.8	33.16	16.95	9.78	10.31	9.9	9.55	0.34
	Average vessel size (dwt)	42,207	34,948	32,847	25,991	5,917			
All ships – Developing economies									
	% of total ships	16.92	21.01	11.29	7.92	42.86	29.03	28.33	0.7
	% of deadweight tonnage	31.4	30.6	12.74	9.75	15.5	16.72	15.91	0.81
	Average vessel size (dwt)	34,624	27,025	22,137	23,195	6,733			
All ships – Developed economies									
	% of total ships	16.15	23.86	14.08	10.76	35.15	19.05	18.51	0.54
	% of deadweight tonnage	29.25	35.13	19.73	9.76	6.12	9.15	9.04	0.11
	Average vessel size (dwt)	53,396	43,538	42,708	28,695	6,589			
All ships – Transition economies									
	% of total ships	6.32	8.82	6.02	3.19	75.66	29.39	28.93	0.46
	% of deadweight tonnage	12.58	28.76	21.23	11.2	26.22	15.59	16.03	–0.43
	Average vessel size (dwt)	14,835	24,533	26,714	25,028	2,447			

Source: UNCNAD secretariat calculations, based on the data from Clarksons Research.

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nal and external factors of the market economy: coordination of terminal service and line representation at the local level, stable cargo flow (export/import), schedule of port calls, loading and unloading operations rates, etc. [16]. The structure of the world market of liner transportation distributes service offers by regions of demand (Table 3). In mid-2018, the cargo capacity of the linear container fleet was 21.9 million TEU, and in 2016 – 19.8 million TEU. The growth of cargo capacity of the container fleet is 2.1 million TEU for a partial period of 1.5 years. In 2016, 127 new container ships were launched, which is 70% lower than in the peak year, 2008. In addition, significant changes in the average size of new ships were revealed. Prior to this, the size of the new fleet had exceeded the size of the existing one, especially in the container segment. This trend, observed until 2016, complicated the relations with port authorities in terms of setting up and handling ships not only in small ports in all regions, but also in large ports in Asia and Europe. The rapid increase in tonnage and cargo capacity of the container fleet resulted in lower rates on the freight of a container, increased costs of the use of containers outside the port and a reduction in the period of free use.

The shortage of container equipment means that reorganization of service centers and regional divisions of container lines is required [17]. Public-private partnerships may be used to accelerate the process of cargo and ship handing at marine terminals. Planning is one of the most significant tools used for the reduction of risks in the management of the fleet and container line as a whole. It is necessary for a container line to plan the routes and ways to navigate regions in order

Table 3

Top 30 major container shipping line operator companies, 2018

Rank	Line operator	Cargo capacity, TEU	Market share,%
1	APM-Maersk	4,118,975	18.7
2	MSC	3,241,555	14.7
3	CMA CGM Group	2,518,195	1.5
4	COSCO Shipping Co Ltd	1,949,516	8.9
5	Hapag-Lloyd	1,611,772	7.3
6	ONE (Ocean Network Express)	1,522,005	6.9
7	Evergreen Line	1,088,509	5
8	OOCL	694,597	3.2
9	Yang Ming Marine Transport Corp.	662,625	3
10	PIL (Pacific Int. Line)	427,624	1.9
11	ZIM	367,566	1.7
12	Hyundai M.M.	358,981	1.6
13	Wan Hai Lines	251,108	1.1
14	X-Press Feeders Group	144,399	0.7
15	KMTC	128,698	0.6
16	Zhounggu Logistics Corp.	126,182	0.6
17	Antong Holdings (QASC)	126,119	0.6
18	SITC	104,071	0.5
19	IRISL Group	96,383	0.4
20	TS Lines	80,761	0.4
21	Arkas Line/EMES	72,717	0.3
22	Sinotrans	61,925	0.3
23	SM Line Corp.	57,992	0.3
24	Sinokor	56,382	0.3
25	Salam Pasific	53,712	0.2
26	RCL (Regional Container L)	49,687	0.2
27	Heung-A Shipping	48,051	0.2
28	Simatech	47,008	0.2
29	UniFeeder	45,775	0.2
30	Grimaldi (Napoli)	44,773	0.2
	Total for the top 30	**20,201,606**	81.7
	Other companies	1,785,690	18.3
	Subtotal	**21,987,296**	100

Source: https://alphaliner.axsmarine.com/PublicTop100/

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to improve its services, to control cargo flow and meet the needs of customers in a particular market segment.

Results

The seasonality of the work of many directions of line service is determined by the specifics of the cargo and requirements of the market. Taking into account the specifics of the cargo of certain segments of the market and the calculation of the fleet from the cargo base, a regional representative of the container line has the opportunity to avoid downtime of ships and non-profitable trips with incomplete loading of the vessel. Therefore, while devising a plan for the future operation of the container lines, the representative works together with regional representatives, considering all options, including the use of PPP, and taking into account the technical capabilities of the port. Thus, a plan of anchoring the vessel is formed; the volume of the processed cargo, the capacity of the terminal, the intensity of the PPP, the rates of terminal and ship fees, etc. are calculated [6]. The recommended period of PPP agreement should be no less than three years, with the minimal investment amount of 200 mln. rub.[3]

Let us now focus on the case of the Russian port of Novorossyisk. In terms of cargo traffic, Novorossiysk is the third largest port in Europe[4]. We calculated the average speed of container handling in PJSC 'NCSP' on the basis of the available terminal group data – *24.4 containers per hour.* This indicator reflects the average value for the varying degrees of vessel capacity and size of container ships making port calls to the port of Novorossiysk to the terminal of PJSC "NCSP" in the first quarter of 2018. The processing speed is directly dependent on the cooperation of the staff of the terminal, freight forwarders, ship agents, stevedores and ship's crew, speed of execution and submission of applications for loading/unloading, preparation of tally sheets, design and supply of rolling stock, warehousing, connection (in case of perishable goods), etc. The container line 'ZIM Russia', in the first quarter of 2018, has an average ship processing speed that is higher than 'Maersk Line' and 'Lider Line'. The most stable speed of container handling is observed in Maersk, which is 29.9 containers per hour.

To compare the performance indicators of Novorossiysk with the world average value of the container ship processing speed, we can look at the average value of the vessel berthing in the port for cargo operations and paperwork.

Table 4

Average container processing speed in PJSC 'NCSP' (container/hour)

Month/ Container Line	ZIM	Lider Line	Standart-F	Maersk	Avg speed, container per hr
January	33.8	16.5	13.8	–	21.4
February	26.7	13.8	–	29.9	23.4
March	37.5	18	–	29.9	28.5
Average speed, container per hr	32.6	16.1	13.8	29.9	24.4

The average time a ship spends in a port is determined by the average speed and the average number of containers for loading and unloading during the given period. The average processing time of the vessel in PJSC 'NCSP' is 22.8 hours or 0.95 days. The indicator of global average processing time of a ship in a port is 0.87 days or 20.9 hours, the difference being 1.9 hours (Table 5) [11, p. 69].

Table 5

Average port time: container ships, 2016, [11]

Country	Port time, days	Total port calls, units
China	0.83	60,795
Japan	0.29	38,415
South Korea	0.49	23,545
USA	0.97	19,844
Taiwan	0.4	16,895
Singapore	0.8	16,159
Malaysia	0.93	15,678
Germany	0.46	14,784
Spain	0.51	14,018
Holland	1.14	12,264
Average world difference	0.87	445,990

Conclusion

As the strategy of port infrastructure development until 2030 indicates, it is planned to improve the processing speed of ships through the construction of new storage spaces; improvement of the existing berthing areas, improvement of the technical characteristics of the lifting base of the port; deepening of the mooring lines; and so on[5]. Nevertheless, the interaction of the port/terminal

[3] *Guidelines for Project Realization of Public-Private Partnership in Russian Regions* (2013). The PPP Development Center, Moscow.

[4] Retrieved from: http://www.nmtp.info/holding/about/

[5] Strategy of Developing Marine Port Infrastructure of Russia Until 2030 (Adopted by the Marine Congress of the Russian Government on 28.09.2012) Retrieved from: http:// www.rosmorport.ru/

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and container line with other contractors forms the order of ship handling [3]. This sequence of relationships reflects the basic principle of supply chains – minimizing transport, time and financial costs throughout the entire cycle of linear service. The real issue, in this case, is the specific characteristics of organization of the container line at the terminal, which can be illustrated by the case of the container terminal of PJSC 'NCSP'. Regarding the line service for container fleet maintenance, the shipowner, as in the case of tramp shipping, can delegate management functions of the company to the regional representative of the line or its operator[6]. The parent company distributes responsibilities to countries/ports of call, which allows the company to respond promptly to changes in operation and tariffs of the port/terminal and control the process of port call service. The interaction of the line operator with the shipowner, in this case, is limited to the contract of freight, the contract of intermediary services and the corresponding document circulation [2; 18]. A contract for the provision of services is necessary if the line operator is located in Russia, in which case it is required to sign a bilingual contract approved by the monetary control of the bank of the line operator. Thus, the shipowner deals with the operational issues of the vessel, while the line operator organizes the operation of the service on the line.

Let us look at this situation in more detail by using the case of PJSC 'NCSP' as an illustration:

A line operator at the terminal of PJSC 'NCSP' performs the following functions and responsibilities:

1. *Cargo towing (chartering)*[7]. The chartering department or chartering manager can be found through outsourcing. The panel broker or line operator independently organizes the work of the chartering department. It needs, however, to coordinate its plans of loading, trips and ship calls with the owner. The costs of ship calls account for most of the transportation expenses, which means that the preliminary calculation of the flight is required at the planning stage.

2. *Port operations.* As a rule, each port/country/region has its own line representative. The line operator interacts with the commercial department of the port/terminal, forms the required contractual relationship, building a chain of financial obligations to the port/terminal, and devises a work schedule based on the capabilities of the port and the schedule of the line's ship calls.

3. *Sales and customers.* When the container line is being organized, it is important to create a customer base and demand for the carrier's services. The competitive environment in the container transportation market is gaining momentum every year. If there is a demand for the carrier's services, the line operator forms the main customer base and informs the customers about the creation or renewal of the service. At the initial stage, the cost of container freight should not exceed the average value in the region, and, while the customer based is still being formed, the cost of freight can be seasonally reduced. A productive relationship with customers is one of the key success factors in the shipping market.

A problem which has to be addressed in Russia is the terms of payment for services. Terms of payment, which is an integral part of the contractual relationship, allow the company to describe in advance the required sequence of money transfers for rendered services, or specify whether a prepayment for services needs to be provided. It is particularly important to build a clearly defined sequence of mutual settlement if the company is working with numerous contractors and intermediaries.

For instance, if, according to the schedule of ship calls formed by the port manager, a container ship arrived at the port of discharge, a container was loaded onto the ship, and the freight of the aforementioned container was not paid for. In this situation, there are two scenarios: the operator may be allowed to unload the container and place it in the warehouse, with a ban on its export/release from the territory of the port until the debts have been payed to the line or, after the container has been fully unloaded, in the absence of payment and any counteractions on the part of the cargo owner/forwarder/charterer of the container, the line has the full right to continue using its own equipment (container) with the goods at its discretion (if the contract does not specify other conditions).

The line operator pays for the storage of containers that are located on the territory of the port/terminal and has the right to decide whether or not they should load the unpaid container together with empty ones, i.e. issue it as re-export. Such an operation may be cheaper for the line than

[6] A line operator is an organization that manages and interacts with contractors on behalf of the Shipowner, which preforms the functions of chartering (booking), organization, accounting and control of the line within the terminal service.

[7] Chartering is the conclusion of the contract of carriage, specifying the specific conditions, mode of transport, terms and periods of shipment, rates per ton or lot.

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paying for a simple container in the port, until it is required, especially if the container is refrigerated and the cargo is perishable. Such situations are common. The cost of storage, including the costs related to its utilization and maintenance, usually ends up having a price range that starts from USD 50 per day[8].

Therefore, if it is possible to use PPP at this terminal with the possibility of signing an individual draft contract for each container line, which will result in the following advantages: an increase in the capacity and turnover of the port/terminal; acceleration of ship handling; expansion of the range of export/import cargoes and goods; reduction in the risk of cargo downtime at the port, delays in ship handling and inappropriate use of port facilities; reduction of the risk of financial indebtedness to the port/terminal, which would eliminate the potential situation of service delay in case of non-payment; and, finally, enhancement of the efficiency of container lines, created by accelerating the turnover of container equipment inside the cycle.

[8] *Port dues, charges and tariffs for service and regulations of their application in the sea port of Russian Federation (Black and Azov sea ports)*, (2014). LLC 'MARITIME TARIFFS CENTER'. Saint-Petersburg: CNIMT Publisher.

Thus, the use of PPPs may well prove to be a feasible solution to the above-described problems. Operation of a container terminal can be affected by unique configurations of internal and external factors. The regional feature allows you to debug the processes of port facilities depending on the cargo situation, weather conditions, tonnage and other features not applicable to ports and terminals in other regions.

The world's merchant fleet is characterized by the rapid growth of deadweight (cargo capacity) tonnage of container ships. This trend contributes to lower transport costs due to economies of scale. However, the amount of container equipment is insufficient. The growth rate of container tonnage (2.1 million TEU) is higher than the growth rate of container equipment. One of the ways to solve the problem is to increase the speed of container handling at port terminals with the help of PPPs The average speed of container handling at the terminal of PJSC 'NCSP' is 24.4 containers per hour. It is proposed to increase the processing speed of container ships by optimizing business processes on container lines through the centralization of container service at the terminal and the consolidation of PPP in the sphere of maritime transport.

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